

CLAIMS

What is claimed is:

1. A twin-wire former for the production of a paper web from a fiber suspension, the twin wire former comprising:

first and second web forming wire belts, means for directing the wire belts to travel along a path together for forming a twin wire zone of the twin wire former, with the web between the wire belts as the wire belts travel along the path through the twin wire zone, neither wire belt defining a single wire predrainage zone of a substantial length;

each wire belt forming an endless loop;

the twin wire zone having a first section which includes a first drainage element at the start of the path through the twin wire zone, means for supporting the belts for forming a wedge shaped entrance slot into the first section, a fiber suspension supplying headbox having an outlet placed and directed for delivering fiber suspension from the headbox to the wedge shaped entrance slot of the first section of the twin wire zone;

the twin wire zone having a second section following the first section along the path of the belts through the twin wire zone; in the second section, a plurality of first drainage strips are positioned for contacting the first wire belt; in the second section, a plurality of second drainage strips are positioned within the loop of the second wire belt and are for contacting the second wire belt; the first strips being shifted in position along the path of the wire belts with respect to the second strips so that the first and second strips are offset and in a non-opposing relationship; first support means for resiliently supporting the first drainage strips against the respective wire belt that strip contacts;

second support means supporting the second drainage strips rigidly against the second wire belt;

first means for collecting the water drained from the fiber suspension by the most upstream one of the drainage strips;

second means separate from the first means for
collecting the water drained from the fiber suspension by all of
the other drainage strips; and

the twin wire zone having a third section following the
second section along the path of the wire belts through the twin
wire zone; a second drainage element in the third section for
being engaged by one of the wire belts as the wire belts travel
over the second drainage element.

2. The twin wire former of claim 1, wherein the first
drainage element is stationary.

3. The twin wire former of claim 2, wherein the first
drainage element is curved and is engaged by one of the wire
belts for curving the path of the belts around the curved
drainage element after the entrance of the suspension into the
entrance slot.

4. The twin wire former of claim 3, wherein the first
drainage element has an open surface to enable drainage of water
from the fiber suspension.

5. The twin wire former of claim 1, wherein the twin
wire zone is free of rolls which deflect the twin wire zone.

6. The twin wire former of claim 1, wherein the twin
wire zone is free of any forming rolls.

7. The twin wire former of claim 1, wherein the first
drainage strips are located within the same wire belt loop as the
first drainage element and the second drainage strips are located
within the other wire belt group.

8. The twin wire former of claim 7, wherein the first
one of the second drainage strips is located upstream of the
first one of the first drainage strips and the last one of the

second drainage strips is located downstream of the last one of the first drainage strips.

9. The twin wire former of claim 1, further comprising means for supplying a vacuum in the area of the second drainage strips.

10. The twin wire former of claim 1, wherein each of the drainage strips has a respective "thickness in the direction along the path through the twin wire zone; neighboring ones of the first drainage strips are spaced a minimum distance of about three times the respective first strip thickness, and neighboring ones of the second drainage strips are also spaced a minimum distance of about three times the respective second strip thickness.

11. The twin wire former of claim 1, wherein the support means for the second drainage strips include means enabling adjustment of the position of the second drainage strips relative to the second wire belt to set the initial rigid position thereof.

12. The twin wire former of claim 11, wherein the support means for the second drainage strips comprise a support body to which the second drainage strips are supported, and bearings on which the support body is supported for enabling displacement of the support body across the path of the wire belts through the second section.

13. The twin wire former of claim 1, wherein the first and second support means comprise a respective individual support body supporting each of at least one of the first and second drainage strips individually, and means supporting the respective support body for each strip to be displaceable for enabling displacement of the respective strip transverse to the direction of the path of the wire belts.

14. The twin wire former of claim 1, wherein the first and second support means comprise a respective individual support body supporting each of the first and second drainage strips individually and means further supporting the respective support body of at least one of the first and second strips for enabling said at least one strip to be moved transverse to the direction of the path of the wire belts.

15. The twin wire former of claim 1, further comprising a curved stationary forming shoe in the first section of the twin wire zone and following after and spaced from the curved drainage element along the path of the wire belts through the first section;

a first section strip disposed at the second wire belt and in the space between the curved drainage element and the curved stationary forming shoe in the first section of the twin wire zone along the path of the wire belts through the twin wire zone for enabling removal of water from the second wire belt.

16. The twin wire former of claim 1, wherein the second drainage element in the third section of the twin wire zone is stationary.

17. The twin wire former of claim 16, wherein the second drainage element is curved.

18. The twin wire former of claim 17, wherein the second drainage element has a curvature that is curved in the same direction as the curvature of the curved drainage element in the first section of the twin wire zone.

19. The twin wire former of claim 18, further comprising an additional strip in the third section of the twin wire zone following the second drainage element and disposed against the other wire belt than the stationary drainage element.

20. The twin wire former of claim 18, wherein the first drainage element in the first section of the twin wire zone and the second drainage element in the third section of the twin wire zone are arranged against the same one of the first and second wire belts.

21. The twin wire former of claim 1, further comprising a suction roll at one of the wire belts and located after the first drainage element along the path of the wire belts; both of the wire belts being wrapped about part of the circumference of the suction roll.

22. The twin wire former of claim 1, wherein the means for directing the wire belts are positioned so that the twin wire zone rises substantially vertically upwardly in the path of travel of the wire belts through the twin wire zone.

23. The twin wire former of claim 1, wherein the means for directing the wire belts are positioned so that the twin wire zone rises gradually upwardly along the path of travel of the wire belts through the twin wire zone at an incline with respect to the horizontal in the range of about 10° to 30°.

24. The twin wire former of claim 1, wherein the first and the second drainage strips in the second section of the twin wire zone are both arranged one after the other along the path of the wire belts through the twin wire zone so as to define a curvature for the path of the wire belts through the second section.

25. The twin wire former of claim 14, wherein the first and second drainage strips are positioned in the second section of the twin wire zone to define a curvature for the path of the wire belts through the second section of the twin wire zone that is opposite the curvature of the curved drainage element in the first section of the twin wire zone.

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26. The twin wire former of claim 1, wherein the means for directing the wire belts are positioned so that the twin wire zone extends substantially horizontally;

the first drainage element in the first section of the twin wire zone being generally curved upwardly for giving the path of the wire belts through the first section of the twin wire zone a generally upward curve; the first and second drainage strips in the second section of the twin wire zone being so positioned as to give the wire belts a generally downward curvature through at least part of the second section of the twin wire zone and the stationary drainage element in the third section of the twin wire zone is curved in a direction to give the wire belts passing through the third section of the twin wire zone a generally upward curvature.

27. The twin wire former of claim 1, wherein the stationary drainage element is curved.

28. The twin wire former of claim 1, wherein the stationary drainage element includes means for providing suction thereto to facilitate drainage of water.

29. A twin-wire former for the production of a paper web from a fiber suspension, the twin wire former comprising: first and second web forming wire belts, means for directing the wire belts to travel along a path together for forming a twin wire zone of the twin wire former, with the web between the wire belts as the wire belts travel along the path through the twin wire zone, neither wire belt defining a single wire predrainage zone of a substantial length;

each wire belt forming an endless loop;

the twin wire zone having a first section which includes a first drainage element at the start of the path through the twin wire zone, means for supporting the belts for forming a wedge shaped entrance slot into the first section, a fiber suspension supplying headbox having an outlet placed and

5 directed for delivering fiber suspension from the headbox to the wedge shaped entrance slot of the first section of the twin wire zone,

the twin wire zone having a second section following the first section along the path of the belts through the twin wire zone; in the second section, a plurality of first drainage strips are positioned within the loop of the first wire belt and are for contacting the first wire belt; in the second section, a plurality of second drainage strips are positioned within the loop of the second wire belt and are for contacting the second wire belt; the first strips being shifted in position along the path of the wire belts with respect to the second strips so that the first and second strips are offset and in a non-opposing relationship; first support means for resiliently supporting the first drainage strips against the respective wire belt that strip contacts, the last one of the second drainage strips being located downstream of the last one of the first drainage strips;

second support means supporting the second drainage strips rigidly against the second wire belt;

the twin wire zone having a third section following the second section along the path of the wire belts through the twin wire zone; a drainage element in the third section for being engaged by one of the wire belts as the wire belts travel over the drainage element, the drainage element having an open surface to enable water to be drained through the wire belt in contact therewith; and

the twin wire zone being free of rolls which deflect the twin wire zone.

30. A twin-wire former for the production of a paper web from a fiber suspension, the twin wire former comprising:

first and second web forming wire belts, means for directing the wire belts to travel along a path together for forming a twin wire zone of the twin wire former, with the web between the wire belts as the wire belts travel along the path

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through the twin wire zone, neither wire belt defining a single wire predrainage zone of a substantial length;

each wire belt forming an endless loop;

the twin wire zone having a first section which includes a first drainage element at the start of the path through the twin wire zone, means for supporting the belts for forming a wedge shaped entrance slot into the first section, a fiber suspension supplying headbox having an outlet placed and directed for delivering fiber suspension from the headbox to the wedge shaped entrance slot of the first section of the twin wire zone;

the twin wire zone having a second section following the first section along the path of the belts through the twin wire zone; in the second section, a plurality of first drainage strips are positioned within the loop of the first wire belt and are for contacting the first wire belt; in the second section, a plurality of second drainage strips are positioned within the loop of the second wire belt and are for contacting the second wire belt; the first strips being shifted in position along the path of the wire belts with respect to the second strips so that the first and second strips are offset and in a non-opposing relationship; first support means for resiliently supporting the first drainage strips against the respective wire belt that strip contacts, the last one of the second drainage strips being located downstream of the last one of the first drainage strips;

second support means supporting the second drainage strips rigidly against the second wire belt;

the twin wire zone having a third section following the second section along the path of the wire belts through the twin wire zone; a drainage element in the third section for being engaged by one of the wire belts as the wire belts travel over the stationary drainage element; and

the twin wire zone being free of any forming rolls.

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